

Cross-domain influences on early word and action learning

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Introduction

In the existing literature, infants' and toddlers' early word and action learning is often studied independently of each other (e.g., Mani & Plunkett, 2008; Woodward, 1998). In social learning situations, however, caregivers usually use concurrent verbal (linguistic) and gestural (non-linguistic) information to communicate with their child.

Recent research indicates that the concurrent use of this information influences how infants process language and actions: For instance, Fukuyama and Yamakoshi (2013) found that 14-month-olds' imitation behavior was influenced depending on whether the action style or the end state of an action was accompanied by social-emotional cues (such as smiling, eye contact, or onomatopoeic verbalization).

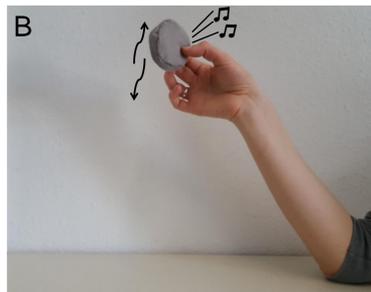
Furthermore, Matatyaho-Bullaro, Gogate, Mason, Cadavid & Abdel-Mottaleb (2014) found that 8-month-olds' word-object learning was facilitated when the objects were presented with a shaking or looming action during labeling. As of yet, however, the interaction between linguistic and non-linguistic information in these learning processes is not completely understood.

Based on this background, the current research further investigates the cross-domain influences of linguistic and non-linguistic information in 18- and 24-month-old toddlers. More specifically, we ask if the use of verbal information before action demonstration influences toddlers' subsequent reproduction of an object-directed action.

Method



Puppet (A) + 2 objects:	Two actions:	Two object-action- pairings:
Hat	Shaking (B)	Shake shoe / Drop hat
Shoe	Dropping (C) (sound effect in both)	Shake hat / Drop shoe



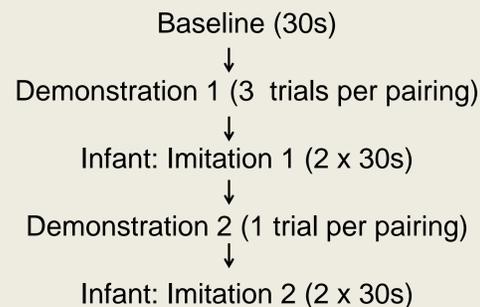
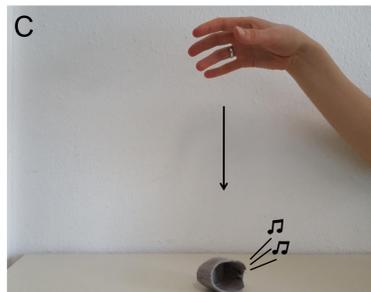
Verbal cues (in form of pseudo words) are given before action demonstration in **4 conditions** (between-subjects):

Noun-Condition
 "Look, a Tanu/Lerki!"

Noun & Verb-Condition
 "Look, I dax/neem the Tanu/Lerki!"

Verb-Condition
 "Look, I dax/neem!"

Control-Condition
 "Look, what I am doing!"



Preliminary Data

18-month-olds: N = 6 toddlers
24-month-olds: N = 6 toddlers

All toddlers were tested in the

Noun & Verb-condition (N = 9)
 or
the Control-condition (N = 3)

Preliminary Results

Coding and Hypotheses

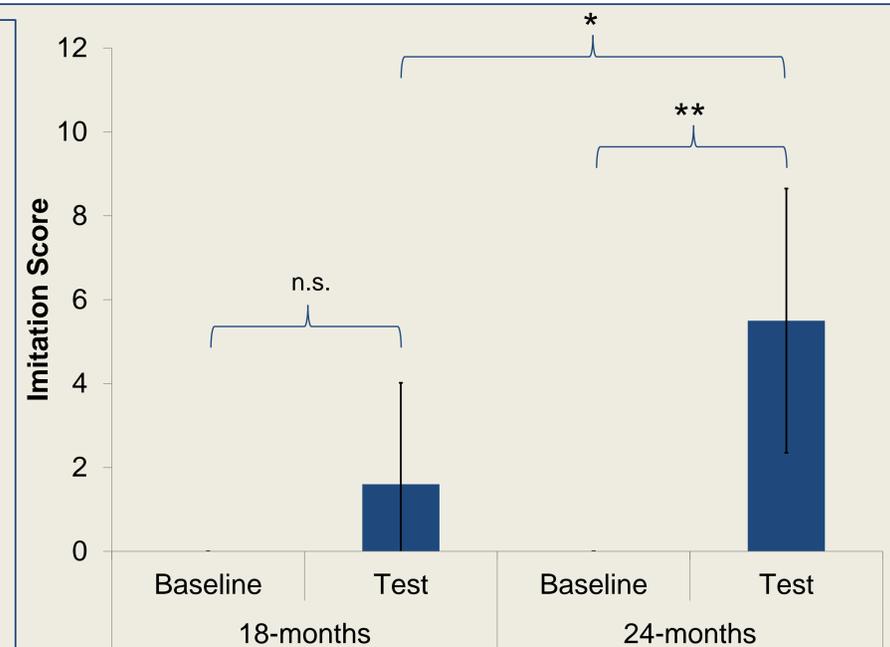
Calculation of imitation Score:

- 1 point for
- Taking off object
- Correct imitation
- Putting object back on

= 3 points per object per trial
 → **maximum of 12 points per toddler**

18-month-olds' Imitation Score:
 N & V > Control ; N & V = Noun/Verb

24-month-olds' Imitation Score:
 N & V > Control ; N & V > Noun/Verb



Main effect phase, $F(1,8) = 18.6, p < .01$; Imitation Score Test phase > Baseline

Main effect age, $F(1,8) = 7.1, p < .05$; Imitation Score 24-month-olds > 18-month-olds

Interaction age x phase, $F(1,8) = 7.1, p < .05$

→ No significant change in Imitation Score from Baseline to Test in 18-month-olds, $t(5) = -1.7, p = .15$

→ Significant change in Imitation Score from Baseline to Test in 24-month-olds, $t(5) = -4.3, p < .01$

Discussion

Preliminary analyses suggest that imitation scores in the 18-month-old sample did not differ significantly between test phase and baseline. The imitation scores in the 24-month-old sample, however, were significantly higher in the test phase compared to baseline. No conclusions regarding effects of condition can be drawn, because the sample size in this condition is too small ($N = 3$) and further data need to be collected.

The current data suggest that the paradigm used in this study might be too difficult for 18-month-olds, because they do not show any sign of imitation from baseline to test. Keeping track of two different objects with two different actions might be too much at once for this age group to memorize and reproduce the actions.

The 24-month-olds, however, show an increase in their imitation score from baseline to test. This is mainly because toddlers in this age group produced more „off“ and „on“ actions, whereas shaking or dropping motions were only produced by 30% of the 24-month-olds.

Therefore, across the next months, we will test further 24-month-olds to test our hypotheses with a suitable sample size. Furthermore, we are currently also testing 36-month-olds to investigate whether older toddlers would memorize more of the action sequences than the younger toddlers. Possible changes to the paradigm or the actions used will be evaluated after the pilot runs are finished.